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ABSTRACT

This study compared the interpersonal behavior and performance of 914 kindergarten through fifth grade children working on a task under cooperative versus competitive conditions. Subjects were 467 urban white, blue-collar family children and 447 suburban white children with parents from predominantly managerial and professional occupations. The children were grouped into like-sex triads and were asked to make a block design. In the cooperative condition the children were instructed to collaborate in producing one product, while in the competitive condition they were instructed to make separate products. Analysis of precoded observations revealed significant main and interaction effects for working condition, grade and social class. Nonverbal behaviors were the principal mode of interaction in competitive conditions, especially among young and working class children. In cooperative conditions, a significant increase in other-oriented behavior occurred with age. No SES differences in this behavior were found for young children. Beginning with third grade, working class children were significantly more other-oriented. Upper middle class children at all ages performed better in competitive conditions. Findings are examined in terms of children's postulated decentration processes and differential parental socialization practice. (Author/JMB)

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Age and Socio-Economic Status in Children's Behaviors In Competitive and Cooperative Working Conditions[1]

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Abstract

This experimental study examines development of social behaviors and performance of kindergarten through fifth grade children who were making a block design in like-sexed triads. In half the triads, children collaborated in one product (cooperative condition). In the other groups, each child made a separate product under competitive instructions. The sample consisted of 467 urban white, blue-collar working class children and 447 suburban white children with parents from predominantly managerial and professional occupations. Precoded observations found significant main and interaction effects for working condition, grade and social class. Nonverbal behaviors were the principal mode of interaction in competitive conditions, especially among young and working class children. In cooperative conditions, a significant increase in other oriented behavior occurred with age. No SES differences in this behavior were found for young children. Beginning with third grade, working class children were significantly more other oriented. Upper middle class children at all ages performed better in competitive conditions. Findings are examined in terms of children's postulated decentration processes and differential parental socialization practice.

Age and Socio-Economic Status in Children's Behaviors In Competitive and Cooperative Working Conditions

This research deals with the development of interpersonal behaviors of children between the ages of six and eleven under working conditions that are defined as "competitive" and "cooperative." We follow here Deutsch's (1949a) differentiation of working conditions as distinct from the various behaviors which may be consequences of these conditions. In a competitive work condition, there is an inverse relationship between the goal-relevant behavior of competitors: if one person moves toward the goal, the others are constrained to be moved away from it. By contrast, in cooperative working conditions, if one person achieves his/her goal, the others have equally achieved their respective individual goals or a shared common goal.

The experimental literature on children's competition and cooperation points to the need for distinguishing three distinct dependent variables: 1) motivation to work competitively or in collaboration, 2) cognitions concerned with competitors or collaborators, respectively, and 3) overt behaviors which are resultants of the preceding variables. Relevant research with regard to each of these variables is examined next.

Developmental Research Involving Mixed Motive Games

In the past twenty years, developmental studies of interpersonal behavior in competitive and cooperative working conditions have seldom appeared in the literature. Almost all published studies on children adopt experimental paradigms used in social psychological research on adult subjects, particularly the mixed motive game models (Wrightsman, O'Connor & Baker, 1972). In this paradigm, pairs of children are presented with a

task in which there are two alternative courses of action: one that would maximize rewards for one, while minimixing them for the other, the second which would give the players equal rewards. For example, a child may be asked to pull a string, push a puck, press a button, etc., against, or in coordination with, another child. The former is termed a competitive or maximizing choice, the latter the coordinative, non-competitive choice.

Given choice between these alternatives, the evidence is that American children in the primary grades are more likely to respond competitively, as compared with young preschoolers (Madsen, 1971; Nelson & Madsen, 1969). It must be noted, however, that a child's decision represents a forced choice between two mutually exclusive and exhaustive alternatives. Each increase in competitive choice, then, automatically results in decrease of coordinated choices. Reported decreases of cooperation in age, may, as one reviewer has pointed out "...simply reflect...an increase in the aging child's competitiveness...whereas observations of children's cooperation within a naturalistic setting may yield different results..." (Bryan, 1975, p. 137).

More cooperation did indeed result in a recent study by McClintock and Moskowitz (1976): when children 5 - 8½ years of age were given opportunities in cooperative settings only for making joint game choices, these coordinative game strategies increased as a function of age. There was no evidence of the development of competitive choices, since competitive strategies were already employed by the youngest children studied. Indeed, children as young as 5 years are reported generally to forego the possibility of obtaining a large reward if given the alternative opportunity to beat a rival under conditions which yield less gain in absolute amount.

Research generated from the game theory model, then, demonstrates that competitive motivations are firmly established by five years of age, and cooperative choices increase from age 5 - 8½. However, these data alone do not permit inferences about other social interactions which may be expected as children work with or against each other in competitive or cooperative working conditions.

Interpersonal Behavior in Competitive Working Conditions

The most exhaustive investigation into children's competitive behavior in a naturalistic setting is that of Sherif (1961). It involved 11-year old boys in a summer camp who were systematically divided into two groups who met in various competitive sports contests over a period of several weeks. Behavior observations showed intense rivalry, hostilities, and sporadic outbreaks of aggression which developed during this time.

An earlier study of college students instructed under a system of competitive grading (Deutsch, 1949b) found similar, though somewhat more negative interpersonal interactions. Students expressed veiled verbal hostilities, sarcasm, criticism of others' contributions and obstruction of others' efforts. Stendler, Damrin and Haines (1951) replicated Deutsch's conditions with seven year olds who were asked to paint a mural first in a group condition for a common reward, and four days later individually under competitive reward conditions. In the latter condition, hostile "teasing" dominated also, as did praise of own work and criticism of others.

In many competitive working conditions of real life, as well as in their simulation in the laboratory, interpersonal interactions are not required. In fact, strong restraints--including social conventions against

display of competitive intent, anger and hostility toward the rival, fear of giving away information which would aid competitors and damage own chances of success--may actively prevent verbal interaction among co-acting competitors. This may account in part for the almost exclusive concentration on performance in research on cooperation and competition in children summarized in the comprehensive report by a subcommittee of the Social Science Research Council (May & Doob, 1937). In general, the studies cited in the report are consistent with the McClintock and Moskowitz (1976) findings of early presence of competition. Rivalry among preschoolers, including 3-year olds, is frequently mentioned, but specific behaviors are not described further. There are descriptions of much non-verbal attention which occurs among competitiors, especially the young, in the form of stealthy glances and silent appraisals of each others' progress.

Such nonverbal attentions, referred to more recently as "social comparison processes," figure prominently in social theories concerned with adult interpersonal behaviors, especially under conditions of uncertainty. They have been postulated to serve self-evaluational functions (Festinger, 1954), as well as information seeking functions (Singer, 1966). From this perspective, competitive conditions may be said to constitute conditions which elicit comparison behaviors. That is, in the process of besting a competitor, his progress must be evaluated, compared against own abilities and accomplishments, or evaluated against some external standard. The likelihood of own and others' success in relation to the goal must be estimated, strategies planned in relation to the others' moves, and so forth.

Attending to others may be particularly important for young children, especially in situations in which children feel that they lack knowledge or skills to carry out assigned tasks, and, therefore will turn to others for needed information. Children's non-verbal attention has been indeed found to occur in conditions of uncertainty and increased task similarity (Pepitone, 1972), as well as with increases in task difficulty (Ruble & Nakamura, 1972). Recently, Ruble, Feldman and Boggiano (1976) have reported the increase of non-verbal attention with age under competitive conditions. The above research suggests that non-verbal attentional behavior may reflect cognitive proces in the service of besting competitors, especially when other overt interactions are non-functional.

Interpersonal Behavior in Cooperative Working Conditions

If one of the salient features of competitive conditions is absence of required verbal interactions, cooperative conditions, by contrast, are characterized by the necessity for interpersonal communication. Also in contrast with competitive conditions, adult collaboration features more friendliness, greater acceptance of others' ideas, more mutual influence, and in general more positive interpersonal relationships (Deutsch, 1949b). These results have been replicated with children of various ages (e.g. Blau & Rafferty, 1970; Gottheil, 1955; Stendler, Damrin & Haines, 1951).

In the aforementioned Social Science Research Council review (May & Doob, 1937), conclusions include generalizations that American elementary school children generally prefer individual relative rewards vs. group rewards (agreeing with McClintock & Moscowitz, 1976), and that superior performance under either of the two working conditions is a function

primarily of task conditions. Further, it is claimed that "simple" cooperative behaviors can be observed in six months-olds (cooperating while being dressed), and that organized play is seldom seen with children under three years. So-called "complex" cooperative behaviors are not further described, and no systematic developmental studies of cooperation are reported.

Consideration of the growth of interpersonal behaviors needed to collaborate might turn to growth of behaviors toward physical objects, especially since the Piagetian view posits parallel development of impersonal and interpersonal cognitions. In regard to cooperation, Piaget himself has expressed the relationship most incisely: "...without interchange of thought and cooperation with others, the individual would never come to group his operations into a coherent whole: in this sense, therefore, operational grouping presupposes social life. But, on the other hand, actual exchanges of thought obey a law of equilibrium which again could only be an operational grouping, since to cooperate is also to coordinate operations..." (Piaget, 1950).

To date, however, developmental research has concentrated almost exclusively on growth of interpersonal cognitions, principally as they are involved in "social role taking" in children (e.g. Feffer, 1971; Flavell, 1968; Selman, 1971, 1976; Selman & Byrne, 1974). Such social cognitions would seem to be necessary for successful "cooperation" of children; however, they need to be translated into behavior which may require additional skills. (It is one thing to perceive that the other wants to proceed differently; it is quite another to know how to solve conflicts of interest.)

As a start in detailing these behaviors, we have turned to formulations about interpersonal interactions which occur in small work groups. Particularly useful is the distinction between member behaviors which arise from specific work requirements of the task--task roles-- and those behaviors which are necessitated by collaborative requirements--group process roles (Bales, 1958). In an earlier study, we explored whether 10 - 11 year-olds can assume these roles spontaneously in cooperative work, and whether they can be taught to improve such skills (Pepitone, 1977). This inquiry involved construction of the two major categories of collaborative behavior whose development is examined in this paper.

Social Class and Socialization of Group Oriented Behavior

Most societies ask of a child that s/he pursue personal goals, yet also be concerned with the good of his/her fellow humans. However, different societies establish a different fulcrum for the balance between these co-existing yet divergent and potentially conflictful directions of relating to others. Particular parental socialization practices may be seen as one powerful mechanism by which normative societal values are passed on concerning the nature and degree of approved individual or other orientation.

Cross-cultural research relating to children's cooperation and competition shows that American children behave consistently more competitively in mixed motive game situations than do children from a number of other countries, in line with their purportedly greater individualism (Kagan & Madsen, 1972a, 1972b; Madsen, 1967, 1971; McClintock & Luttin, 1969; Nelson & Madsen, 1969; and Shapira & Madsen, 1969).

However, the Bryan (1975) and Cook and Stingle (1974) reviews concur that results from the relatively rare research comparisons across socio-economic class are confusing and often contradictory. This may be in part a function of differences in the tasks employed, and of the relatively narrow comparative age ranges of the studies. With a consistent theoretical perspective, several of the studies begin to provide some useful leads. For instance, Brotsky and Thomas (1967) and Nelson and Madsen (1969) found no differences in cooperation between middle class and lower class four year olds. No other studies have reported class differences with preschool children either, nor have attempts at improving collaboration of 4 - 6 year olds been successful (Kagan & Madsen, 1971). Presumably, collaboration depends on other oriented social cognitions which are not sufficiently developed in these age groups, regardless of social background.

For older children, Madsen's series indicates that lower class rural children generally make more cooperative choices, while urban middle class children tend to compete more (Madsen, 1967; Shapira & Madsen, 1974). While various interpretations are possible, results are in line with demonstrated patterns of middle class independence training and achievement orientation (Rosen & D'Andrade, 1959; Winterbottom, 1953) vs. lower class socialization toward obedience (Bronfenbrenner, 1958).

Kohn (1963, 1969) has given a particularly cogent causal analysis based on his research of values relevant to parental socialization practices of populations directly comparable to our sample. Following a sociological tradition which can be traced to Marx and Weber, he links parental values to different occupational demands, reinforced by differences in general

conditions of life. That is, upper middle class occupations are likely to be free of close supervision and require personal responsibility and initiative; therefore, parents of this population will tend to stress self-direction in their children. By contrast, working class occupations are more subject to standardization and direct supervision which requires conformity to rules and procedures established by authority; hence, emphasis in the socialization pattern of working class parents is on conformity to externally induced proscriptions.

Assuming existence of these two differing socialization patterns, they may be expected to affect behavior and performance of children from different socio-economic backgrounds, at different ages, when placed into competitive and cooperative working conditions, as follows:

1. If collaboration depends on development of other oriented cognitions, neither upper middle class kindergartners nor their working class counterparts will engage to any substantial degree in the other oriented behaviors required in cooperative work.

2. Somewhere between the ages of 7 - 9 a significant increase in other oriented behavior in children of both social classes may be expected; however,

3. If performance in cooperative conditions requires responsiveness to others, and if conformity training strengthens such "sociocentrism," working class children of approximately 8 years and older will engage in significantly more other oriented behavior and perform better than will their upper middle class counterparts.

4. If middle class independence training strengthens ability to work alone and heightens achievement motivation, middle class children will perform better and pay more attention to their competitors than will their

working class counterparts. Since competition does not require understanding of others' perspectives, and is in fact concerned primarily with individual goal attainment, these class-related differences will begin to appear in the ego-centric preschcol child's behaviors and performance under competition and continue throughout the elementary years.

Method

Subjects

The two studies (Murdoch, 1974; Loeb, 1975) were undertaken simultaneously in two Philadelphia schools in two districts which differed widely in socioeconomic status. Each study, respectively, involved the total population, kindergarten through fifth grade, in one elementary school, excluding only children designated as behavior problems or those in special learning classes. Four hundred sixty-eight children were from a city school whose parent population was white, and, according to the 1970 census information[1] for the district in which the school was located over 80% of parents were classified as blue collar workers, and only 7% professionals and hence designated as Working Class (WC). Four hundred fifty children came from an affluent suburban school district with white parents, over 90% of whom were employed in professional and managerial positions and hence designated as Upper Middle Class (UMC). Mean ages of children and number of groups at each grade are given in Tables 2 and 3.

Procedure

The basic procedure was identical with the standard methodology developed and used in our studies concerned with childrens' cooperation and competition (for details, see Pepitone, 1973, Chapter 2). It involved

triads of like-sexed children, taken at random from a given classroom, one triad at a time, to a spare room in the school. The children were placed around a circular board, forty inches in diameter, on which they were asked to make a flat picture of a person with wooden blocks of various shapes and colors. The surface of the board consists of a flannel-like substance commercially known as Velcro; the blocks are adapted from the McGraw Hill Pattern Blocks for Science so that they adhere to the board as desired. Children are able to work with the task at their particular age level, so that this activity is enjoyed by children of all ages, and allows comparison of performance at different age levels at the same time. In different studies in this series, children have been required to make different designs, depending on the needs of the particular experiment. In the present investigations, construction of a person was selected, because it was considered an activity suitable for the age range studied. This proved to be the case.

Half of the triads from each classroom were required to make one picture of a person together (cooperative work condition), while in the remaining triads each subject was to make one person on the board by himself "to see which one of you three can make the very best picture" (competitive work condition). No time limits were set for completion.

Polaroid pictures were taken of the final products so that various performance indices could be computed from analysis of the photographs. The photographs were used additionally in strengthening the experimental variables in that all children were informed at the outset that we were "writing a book and some of the pictures will be included." In the competitive

condition, they were told that the best block picture would be photographed and included, while in the cooperative condition it was stated that if the group did well, a photograph of their product would be taken. Before concluding the session, each product was photographed regardless of condition. Children were included in the photographs, which thus assumed an added function in debriefing the children, sending them away pleased with their experience.

Performance Measures

The children's products were scored from the polaroid photographs. Sixteen separate indices were explored. This paper deals only with the most inclusive measure of quality of performance, obtained by adding separate elements of the human figure including major parts of the body (head, neck, arms, legs, etc.) as well as embellishing details (fingers, hair, ribbons, hat, trousers, and assorted objects added to the person such as baseball mits, bats, hockey sticks, etc.). The index thus obtained correlated highly with number of pieces used, length of working time, and number of details. It may be taken to reflect motivational aspects (assuming that the greater the personal involvement, the more time spent with the task, number of pieces used, etc.) as well as skill in execution of the task. The scoring scheme assigned points for each detail. Two independent scorers scored each photograph, with 93% agreement. Differences were adjusted after discussion.

Behavior Observations

Two experimenters, each in charge of data collection at one of the two schools, jointly developed the observation scheme. Prior to the execution

of the study, the two experimenters and four observers worked together in pilot studies over a period of three months. Approximately thirty groups were tested, while the behavior categories were refined and observers trained in their use. Before the start of the study, inter-observer agreement reached the criterion set at minimally 90% for each category. Throughout data collection, each experimenter worked with two observers at one school for two weeks at a time, followed by one week during which the observer pairs were broken up and systematically rotated to work with the other observers at the other school, including observations from each grade and from each of the two conditions. Five such observer exchange weeks took place throughout the study. The criterion of 90% was met easily during each of these rotation periods, as the observers had developed almost machine-like precision.

The unit of verbal behavior was taken as the period of a child's speech separated by a pause, or by another child's verbalization. Non-verbal behavior was differentiated by change from one act to another. Recording was continuous. A total of 14 categories were defined; categories with an average of two or less interactions per grade are excluded from analysis here, as are categories which are irrelevant to our present concerns.[2]

Interaction Categories

The rationale for the conceptual definition of the respective categories has been presented earlier; therefore, only operational definitions are given below.

1. Non-verbal attention. Children's looking at co-acting children or examining their work.

2. Task oriented behaviors. This category included all verbal communication directly relating to the task including neutral comments about aspects of the product, and positive and negative evaluations of progress, quality of product, colors of blocks, and the like.

3. Other oriented behaviors. Two criteria were employed. The behaviors must be: (a) acts which can be judged to require consideration of the other members' points of view, their expectations, demands, opinions and feelings; (b) acts which can be construed to advance members toward their common goal. They included non-verbal behaviors such as handing out blocks either unsolicited or in response to requests, helping another child to complete part of a pattern, adding pieces to a common part, and the like. Verbal interactions included suggestions made to others about their contributions, soliciting agreement, exchanging opinions for next steps, requests for approval of own procedure or contribution to the group's product, and so on.

Results

Based on evidence of performance uniformities within groups (Pepitone, Loeb, & Murdoch, 1977), individual triads were adopted as the unit of analysis. Intercorrelations among the four dependent variables were relatively low, but the total number of sign effects was larger than could be expected by chance. However, because of the complexity involved in a simultaneous statistical treatment of the dependent variables, a separate 2 (Social Class) x 2 (Work Condition) x 6 (Grade) x 2 (Sex) ANOVA--corrected for uneven cells--was performed on each of the four dependent variables: Non-verbal attention, task oriented behavior, other oriented behavior, and

performance. As a protection against gaining significance by increasing the number of analyses, a conservative level was adopted, $p = .01$.

Overview of Findings

Table 1 presents means for the four dependent variables--non-verbal attention, task oriented behaviors, other oriented behaviors and performance--for three grouping factors: working condition, sex, and SES.

Insert Table 1 About Here

Comparing competitive and cooperative working conditions, it is evident that the differences in means for each of the four dependent variables are highly significant. Overall, there is more social interaction and a higher quality of performance under cooperation, while significantly more non-verbal attention occurs in competitive working conditions.

There are no differences in mean behaviors and performance of boys and girls. Since there were no significant main effects or interactions involving sex for any of the dependent variables, this factor will not be considered further.

Large differences were also found in behavior and performance of children from different socio-economic backgrounds. As predicted, there were several significant effects for SES as well as grade, both separately and in interaction. Tables 2 and 3 present means for each of the four dependent variables, at each grade and socio-economic level, for cooperative and competitive conditions, respectively. Each of the dependent variables are examined next in the light of the three grouping factors.

Insert Tables 2 and 3 About Here

Non-Verbal Attention

The mean non-verbal attention, 30.84, represents 72% of the total behavior in the competitive condition. The mean of 13.48 corresponds only to 12.5% of behavior in the cooperative condition.

A second main effect was obtained for SES: WC children engage in significantly more non-verbal attention than do UMC children. Two additional analyses of variance, performed separately for the two respective working conditions, showed the locus of differences resting in the cooperative condition: no main or interaction effects were found for the competitive condition. In the cooperative condition, however, WC children engage in more non-verbal attention, F (1, 132) = 11.39, $p < .003$. Applying Scheffé's test for linearity, a systematic decrease in this behavior was established over the grades for WC children only, $F = 17.97$, $p < .001$.

Task Oriented Verbalizations

As may be seen in Table 1, over twice as many task oriented verbalizations occurred in the cooperative condition as compared with the competitive condition. This does not mean that in the cooperative condition children work more; rather it means that children discussed their work with each other significantly more often in the cooperative condition than in the competitive condition, the latter being, as previously shown, the condition in which primarily non-verbal behavior takes place. This is the only variable for which no main effects for SES were established.

A second main effect was found for grade, in ascending order from 8.09, 17.83, 15.60, 17.58, 18.24, and 29.90. The test against a linear

contrast was significant for WC children in cooperative conditions (Scheffé's test, $F = 23.51$, $p < .001$). For this condition only, a significant interaction between SES and grade was determined, $F = 19.35$, $p < .001$. Table 3 shows a pattern in which UMC kindergartners and first graders engage in more task oriented behaviors. The trend begins to reverse itself at grade 3, when WC children show more of this behavior. By fifth grade, this difference reaches statistical significance by the Newman-Keuls test.

Other Oriented Behavior

These behaviors were assumed to be of central importance in cooperative conditions. Indeed, the main effect for condition is very strong. The comparative means in Table 1 indicate that other oriented behaviors are almost wholly absent in the competitive condition. Table 3 documents further the very small amoung of this behavior found at each grade level and for both SES groups in the competitive condition.

As predicted, a main effect was found for grade, $F\ (5, 258) = 10.23$, $p < .001$. Means with ascending age were 2.87, 5.16, 7.14, 13.96, 13.29, and 17.64. To be noted here also is the abrupt increase in this behavior from second to third grade--more than doubling in amount--as compared to the relative stability between different adjacent ages.

While it is evident from Table 2 that the general increase in other oriented behaviors with age under cooperative conditions holds for children from both socio-economic backgrounds, the third predicted main effect for SES was also found. Table 1 shows that WC children have significantly more other oriented interactions than do UMC children. A number of higher order interaction effects were determined as well; these are summarized in Table 4.

The interaction between SES and the two other classifying factors is subsumed under the triple interaction shown for SES x Grade x Condition. The latter is best understood by reference to Figure 1.

Insert Table 4 and Figure 1 About Here

Figure 1 gives a graphic representation of developmental trends in other oriented behaviors in the cooperative condition for children from the two SES backgrounds. The previously discussed growth of these behaviors with age is demonstrated. However, the sudden increase between second and third grade appears to be attributable primarily to WC children. Newman-Keuls tests of the significance of the differences at each grade point between mean behaviors of children from the two different SES groups confirm the strong trend evident by inspection: the differences are not significant throughout the first three grades. Thereafter, at each grade point, WC children have significantly more other oriented behavior than their UMC counterparts.

Performance

Table 1 shows the mean performance in cooperative conditions, 32.26, superior to that in competitive conditions, 25.16. A second main effect was found for grade, F (5, 258) = 33.99, $p < .001$. The interaction between Grade and Condition is also significant, F (5, 258) = 4.04, $p = .002$.

Insert Table 5 About Here

Table 5 gives the performance means for children from combined socio-economic backgrounds, for each of the two respective conditions at each grade level.

The mean performance of kindergartners is slightly higher under competitive conditions than under cooperative conditions. During the first three grades, differences in performance under the two working conditions are not significant. The mean performance for grades 3 - 5 is significantly higher in cooperative working conditions. This gradual shift in superiority of performance from competitive to cooperative condition is reflected in the interaction between Grade and Condition, F (5, 258) = 4.04, $p < .002$.

Table 1 shows that, in addition to effects for Condition and Grade, a third main effect was obtained for SES. Overall, it favors performance of UMC children, 31.15 vs. 26.28 for WC children. Table 4 shows a significant interaction of SES with Grade, F (5, 258) = 2.67, $p = .02$.

In the competitive condition, the mean performance for UMC children is 27.74, as contrasted with 22.58 for WC children. A three way ANOVA shows this difference to be significant, F (1, 126) = 17.10, $p < .001$. Figure 2 shows that the performance level of UMC children is above that of WC children at each grade point.

In the cooperative condition, UMC children, with a mean of 34.55 vs. WC children's 29.97, perform also significantly better, F (1, 132) = 6.47, $p = .002$. However, their superiority persists only through the first three grades; thereafter, WC children perform at the level of their UMC counterparts. The interaction of Grade x SES, F (5, 132) = 3.03, $p = .01$, underscores this pattern. It is depicted in Figure 3.

Discussion and Conclusions

Theoretically, both competitive and cooperative work involves motivation and cognitive, manipulative and interpersonal abilities.

However, the degree to which these factors are involved differs in the two conditions.

The central feature which determines behavior in competitive situations is the motivation to achieve for oneself and/or to best others. Presumably reflecting this motivation, 88% of the children indicated on a precoded questionnaire that they "wanted very much to win." While in some competitive conditions blocking of opponents may be advantageous, or even essential to success, our competitive condition was apparently perceived as not requiring interpersonal interactions of any kind, judging by its exceedingly low level.

The major relationship among competitiors is cognitive, in that each person is concerned with assessing the others' activities and accomplishments. In children's competition in particular, such evaluations do not require awareness of others' perspectives, but only the simplest kind of social comparisons. If children wanted to compare in our work situation, they could tell at a glance what the others were doing, how well they were doing it, or how far they had progressed. The non-verbal attentional measure had been designed to reflect such comparison processes. However, while there was more of this behavior under competition, it did not vary with age. This might plausibly be explained by postulating that the two functions of social comparison have an opposing relationship to age. That is, as cognitive and social skills grow, and children gain in self-confidence, dependence on others for needed information in work situations may decrease with age. Our findings from cooperative conditions--where competitive evaluations presumably are largely absent--show this age-related decrease in non-verbal attention. Self- and other evaluational processes should increase as

aspirations, achievement and competitive motivations develop with age. The Ruble, Feldman and Boggiano (1976) study minimized information which could be gained by glancing at competitors, but allowed children to compare their relative progress with each other. Under these conditions, an age-related increase in attentional behavior was found. With our task, both comparison functions were possible: inspection of others' work could yield information as to construction of the human figure, as well as disclose extent of competitors' progress. Our data emphasize the need to separate these processes. They also speak to the necessity of not merely establishing presence of evaluation, but also of specific cognitive processes--estimation of progress, attribution of others' abilities and the like--involved in comparison of competitors with self.

Cooperative work requires sociocentric cognitions: rather than being concerned with advancement of self-oriented needs, concern is with the opinions, desires, intentions and similar internal states to be inferred about other members with whom cooperative goals are shared. Relative to the role played by motivation in competitive situations, desire to collaborate is necessary but by no means sufficient. More "advanced" cognitive and interpersonal skills are essential for successful "cooperations" (Piaget, 1950).

Our measure of other oriented behaviors has demonstrated the growth in children's interpersonal skills. Whether these developmental changes represent merely a quantitative increase, or a growth in diverse skills needed to collaborate cannot be decided from the data. Inferences as to the nature of sociocentric cognitions which may have mediated these

behaviors can be conjectural only. The growth pattern of other oriented behaviors with its sudden increase between ages 8 - 9 corresponds closely to the social decentration periods reported by Feffer (1971), Selman and Byrne (1974), and others.

Selman's (1976) scheme would seem to hold great promise for independent measurement of social cognitions needed in collaboration. In the earliest stage (about ages 4 - 6) the other is considered only in relation to egocentric needs. This would begin to describe the kind of social cognitions which we assume operate in competitive situations. Research which we have reviewed has demonstrated consistently ability of preschoolers to make competitive choices. Our findings of kindergartners' tendency to perform better in competitive situations, coupled with their small amount of other oriented behaviors regardless of SES status, makes it likely that they were functioning at this level.

The increase in other oriented behaviors shown by us suggests a correspondence to Selman's stage 2 (ages 8 - 10, in which the child presumably is able to anticipate other's reactions to his own motives and purposes), or stage 3, in which impartial understanding of group members is said to become possible.

Motivation, cognitive and social skill factors combined in childrens' performance. The fact that it is only at about age nine that performance in cooperative conditions is superior to that in competitive conditions demonstrates that successful collaboration requires development of social and cognitive skills. The fact that performance after this age is superior in cooperative conditions we would ascribe, as did May and Doob (1937), to

characteristics of the task itself. That is, given the skills to do so, a human figure lends itself to embellishment so that three children together can produce a more complex figure than most children working alone. We would interpret the higher performance score in cooperative conditions as being specific to this particular task. Presumably, given tasks which would lend themselves better to solitary performance, or given tasks which would demand complex interpersonal skills not yet possessed even by the oldest children, the performance pattern could be reversed in favor of competitive conditions.

Social Class, Behavior and Performance

Overall superiority in performance of UMC children compared with WC children in both competitive and cooperative condition appears to illustrate once again the well-documented achievement advantages of UMC children. If the larger amount of non-verbal behavior of WC children, especially the youngest, is interpreted as information seeking, it lends support to this interpretation. Absence of class-related differences in task oriented behaviors suggests that both groups of children are involved in their work, but UMC children have a higher level of task-related skills that enable them to produce a more complex product.

While the "social advantage hypothesis" would also be supported by UMC children's superior performance at each age level in competitive conditions, it is only partly the case for the cooperative condition. When still in the process of decentering, the youngest children from both SES backgrounds do not differ in other oriented behavior, but UMC children's performance is significantly more complex. When WC children's other oriented behavior becomes significantly more frequent by nine years of age, and remains so

thereafter, and their task-related discussion increases also, their performance moves up to the level of their UMC counterparts. UMC children's greater task related skills and potentially superior performance were not realized, we would suggest, because of their insufficient exercise of other oriented behaviors needed in cooperative work.

We offer a speculative interpretation of the above trends along the lines of Kohn's (1963) thesis. Assume that WC emphasis on obedience to authority results indeed in children's greater openness to adult social influence. This socialization practice may have the unintended effect of creating in the children greater dependency not only on adults (including parents, teachers and future employers), but also on age peers (viz. WC children's large amount of non-verbal attention). It may have the additional unintended effect of creating greater responsiveness to others, as reflected in their heightened other oriented behavior toward each other.

Analogously, UMC independence- and achievement training may accomplish its aims of "creating" children who are self-sufficient, competent and highly goal-oriented. However, by praising children's independent pursuit of personal goals, parents may be unintentionally reinforcing children's egocentric ways of thinking and behaving. Thus, UMC training may be accomplished at the expense of children's development of other orientations.

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Footnotes

[1]Because of school policy, access to childrens' records was not possible. This prevented classification of each particular child by parental status. While the latter procedure would have been preferable, the two schools constituted different samples from two very different populations and hence were acceptable for our research which deals with statistical averages rather than individual ceres.

[2]Categories which are not examined here because of rare occurrence included a variety of negative individual behaviors (obstructing another's efforts, physical aggression, taking blocks from another) calling attention to self, asserting supiority. Conceptually, several of these behaviors represent attempts at besting others; hence it was hoped that they might turn out to be valid measures of competitive motivation. Their rare occurence in the present study made their analysis impossible. Also excluded were categories of little relevance here which focused on specific work patterns, interactions with the experimenters and the like.

Table 1

Mean Behavior and Performance by Condition, Sex, and Social Class

	Condition				Sex				Social Class			
Behavior and Performance	Coop	Comp	F*	p	Boys	Girls	F*	p	UMC	WC	F*	p
Nonverbal attention	13.48	30.84	45.40	.001	22.37	21.96	0.03	-	18.67	25.66	7.37	.008
Task oriented	24.10	11.64	26.05	.001	19.40	16.34	1.57	-	18.73	17.01	.49	-
Other oriented	19.11	0.90	152.05	.001	10.41	9.60	0.30	-	6.50	13.60	23.08	.001
Performance	32.26	25.16	41.04	<.001	28.21	29.21	0.83	-	31.15	26.28	19.35	<.001

*df (1, 258)

Table 2

Mean Behavior and Performance in Cooperation Conditions

By Grade and Social Class

	Grade					
	K	1	2	3	4	5
Mean Age						
UMC*	5.8	6.9	7.9	8.6	9.9	10.8
WC**	5.7	6.8	7.8	8.9	9.9	10.9
Nonverbal attention						
UMC	14.73	8.43	6.54	2.46	14.38	3.53
WC	33.07	34.83	17.57	14.98	7.33	3.91
Task oriented						
UMC	19.70	29.01	18.89	19.9	22.93	25.64
WC	9.51	17.64	19.13	26.84	28.50	51.50
Other oriented						
UMC	3.70	7.61	13.23	13.52	14.96	22.14
WC	7.38	12.19	11.90	39.63	36.83	46.17
Performance						
UMC	18.70	33.39	35.83	38.12	42.07	39.19
WC	9.75	21.48	25.10	45.98	37.50	40.00
N (Groups)						
UMC	8	13	12	15	13	18
WC	15	13	12	13	12	12

*UMC = Upper Middle Class

**WC = Working Class

Table 3

Mean Behavior and Performance in Competitive Conditions

By Grade and Social Class

	Grade					
	K	1	2	3	4	5
Mean Age						
UMC*	5.8	7.0	7.8	8.8	9.9	10.8
WC**	5.8	6.9	7.8	9.2	9.8	11.0
Nonverbal attention						
UMC	30.88	24.75	28.33	31.99	23.10	34.85
WC	26.36	33.93	41.86	36.60	34.38	23.10
Task oriented						
UMC	1.13	9.25	11.08	12.86	17.98	15.77
WC	2.02	15.43	13.29	10.63	3.54	26.70
Other oriented						
UMC	0.38	0.19	0.38	0.27	0.60	0.54
WC	0.0	0.64	3.07	2.33	0.75	2.68
Performance						
UMC	19.50	23.13	30.38	31.16	31.08	31.23
WC	12.54	20.29	22.21	28.22	26.04	26.20
N (Groups)						
UMC	8	12	10	15	9	17
WC	15	14	14	16	10	10

*UMC = Upper Middle Class

**WC = Working Class

Table 4

Interaction Effects for Group Oriented Behaviors and Performance

	df	F	p
Other Oriented Behavior			
SES x Condition	1,258	16.89	.001
SES x Grade	5,258	2.85	.017
SES x Grade x Condition	5,258	2.83	.017
Performance			
Condition x Grade	5,258	4.04	.002
SES x Grade	5,258	2.67	.02

Table 5

Mean Performance in Cooperative and Competitive Conditions by Grade

		Conditions	
Grade	Mean Age	Cooperation	Competition
		Mean Performance	Mean Performance
K	5.8	14.23	16.02
1	6.8	27.44	21.71
2	7.8	30.46	26.30
3	8.8	42.05	29.69
4	9.9	39.79	28.56
5	10.9	39.59	28.72

Figure 1

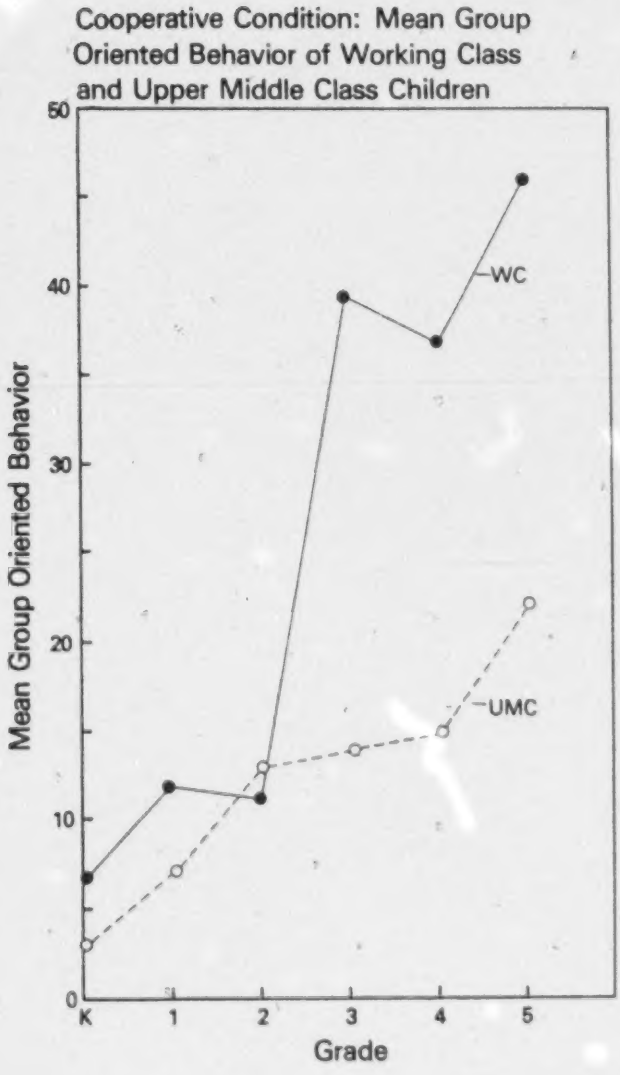

Cooperative Condition: Mean Group Oriented Behavior of Working Class and Upper Middle Class Children
Mean Group Oriented Behavior
50
40
30
20
10
0
WC
UMC
K
1
2
3
4
5
Grade

Figure 2

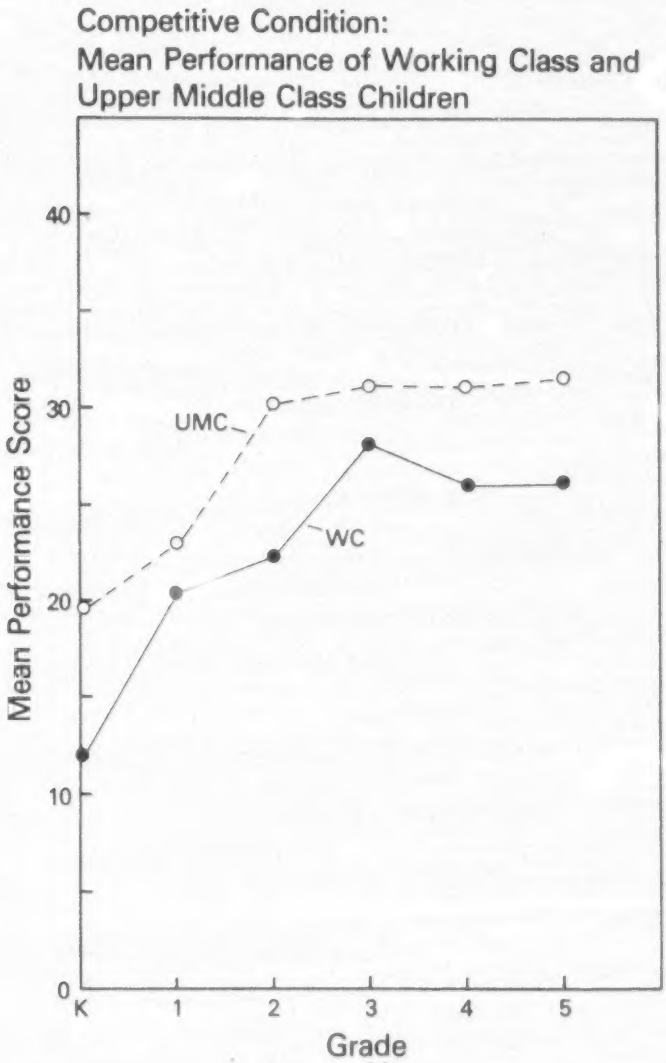
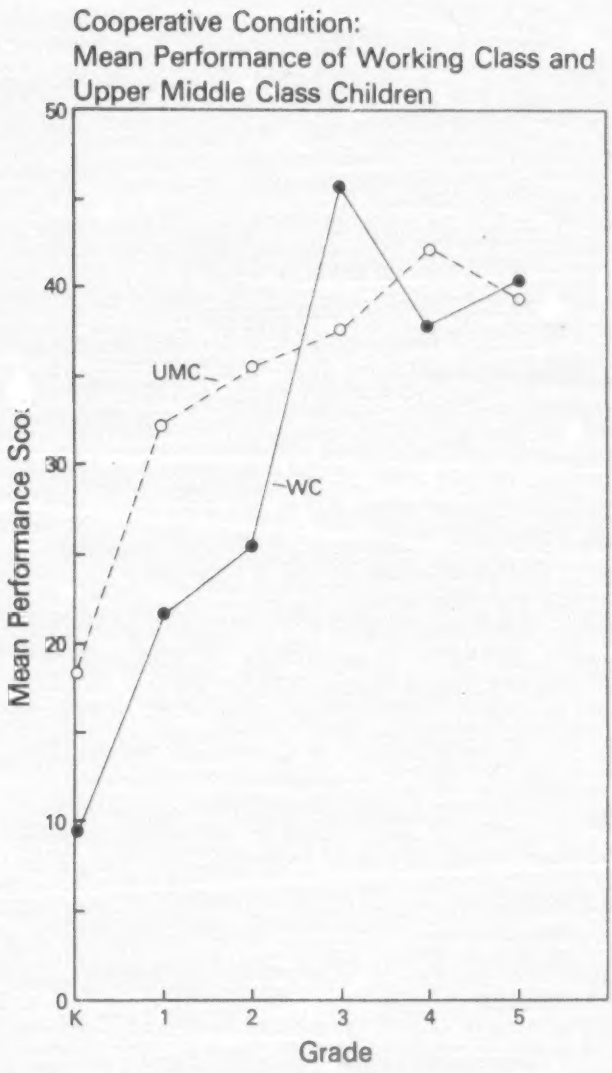

Competitive Condition:
Mean Performance of Working Class and
Upper Middle Class Children
Mean Performance Score
40
30
20
10
0
UMC
WC
K
1
2
3
4
5
Grade

Figure 3


Cooperative Condition:
Mean Performance of Working Class and
Upper Middle Class Children
Mean Performance Sco
50
40
30
20
10
0
UMC
WC
K
1
2
3
4
5
Grade